

SEARCHED & LISTED



<110> JENTSCH, Thomas J.

<120> NOVEL POTASSIUM CHANNELS AND GENES ENCODING THESE POTASSIUM CHANNELS

<130> 2010-127P

<140>

<141>

<160> 41

<170> PatentIn Ver. 2.1

<210> 1

<211> 2335

<212> DNA

<213> Homo sapiens

<220>

<221> gene

<223> (1)..(2335)

<220>

<221> CDS

<223> (33)..(2170)

<400> 1

tgccatgcgt ctctgagcgc cccgagcgcg ccccccgcgg ggaccgtgcc cggggcccg 60

tggcccccgc ccggcgccgc cc atg gcc gag gcc ccc ccc cgc cgc ctc ggc 112
Met Ala Glu Ala Pro Pro Arg Arg Leu Gly
1 5 10ctg ggt ccc ccc ggg gac gcc ccc cgc gcg gag cta gtg gcg ctc 160
Leu Gly Pro Pro Gly Asp Ala Pro Arg Ala Glu Leu Val Ala Leu
15 20 25acg gcc gtg cag agc gaa cag ggc gag gcg ggc ggg ggc tcc ccc 208
Thr Ala Val Gln Ser Glu Gln Gly Glu Ala Gly Gly Gly Ser Pro
30 35 40ccg cgc ctc ggc ctc ctg ggc agc ccc ctg ccc cgc ggc ggc ccc ctc 256
Arg Arg Leu Gly Leu Leu Gly Ser Pro Leu Pro Pro Gly Ala Pro Leu
45 50 55

140	141	142	143												
Arg	Sly	Trp	Ala	Sly	Arg	Ile	Arg	Ile	Ala	Arg	Lys	Ile	Ile	Cys	Val
144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Ile	Asp	Phe	Ile	Val	Phe	Val	Ala	Ser	Val	Ala	Val	Ile	Ala	Ala	Gly
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Thr	Gln	Gly	Asn	Ile	Phe	Ala	Thr	Ser	Ala	Ile	Arg	Ser	Met	Arg	Phe
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Ile	Gln	Ile	Ile	Arg	Met	Val	Arg	Met	Asp	Arg	Arg	Sly	Sly	Thr	Trp
192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Lys	Ile	Ile	Gly	Ser	Val	Val	Tyr	Ala	His	Ser	Lys	Glu	Ile	Thr	
208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Ala	Trp	Tyr	Ile	Gly	Phe	Leu	Val	Ile	Phe	Ala	Ser	Phe	Leu	Val	
224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Tyr	Ile	Ala	Glu	Lys	Asp	Ala	Asn	Ser	Asp	Phe	Ser	Ser	Tyr	Ala	Asp
240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
Ser	Ile	Trp	Trp	Gly	Thr	Ile	Leu	Thr	Thr	Ile	Gly	Tyr	Gly	Asp	
256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271
Lys	Thr	Pro	His	Thr	Trp	Leu	Gly	Arg	Val	Leu	Ala	Ala	Gly	Ala	
272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287
Ile	Ile	Gly	Ile	Ser	Phe	Phe	Ala	Ile	Pro	Ala	Gly	Ile	Leu	Gly	Ser
288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303
Gly	Phe	Ala	Leu	Lys	Val	Gln	Glu	Gln	His	Arg	Gln	Lys	His	Phe	Glu
304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319
Lys	Arg	Arg	Met	Pro	Ala	Ala	Asn	Leu	Ile	Gln	Ala	Ala	Trp	Arg	Leu
320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335
Tyr	Ser	Thr	Asp	Met	Ser	Arg	Ala	Tyr	Leu	Thr	Ala	Thr	Trp	Tyr	Tyr
336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351
Tyr	Asp	Ser	Ile	Leu	Pro	Ser	Phe	Arg	Glu	Leu	Ala	Leu	Leu	Phe	Glu
352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367
His	Val	Gln	Arg	Ala	Arg	Asn	Gly	Gly	Leu	Arg	Pro	Leu	Gln	Val	Arg
368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383
Arg	Ala	Pro	Val	Pro	Asp	Gly	Ala	Pro	Ser	Arg	Tyr	Pro	Pro	Val	Ala
384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399
Tyr	Cys	His	Arg	Pro	Gly	Ser	Thr	Ser	Phe	Cys	Pro	Gly	Glu	Ser	Ser
400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415
Arg	Met	Gly	Ile	Lys	Asp	Arg	Ile	Arg	Met	Gly	Ser	Ser	Gln	Arg	Arg
416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431
Tyr	Cys	Pro	Ser	Lys	Gln	Gln	Ile	Ala	Pro	Pro	Thr	Met	Pro	Thr	Ser
432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447
448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463
Pro	Ser	Ser	Glu	Gln	Val	Gly	Glu	Ala	Thr	Ser	Pro	Thr	Lys	Val	Gln
464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479
Lys	Ser	Trp	Ser	Phe	Asn	Asp	Arg	Thr	Arg	Phe	Arg	Ala	Ser	Leu	Arg
480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495
Leu	Lys	Pro	Arg	Tyr	Ser	Ala	Glu	Asp	Ala	Pro	Ser	Glu	Glu	Val	Ala
496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511
Glu	Glu	Lys	Ser	Tyr	Gln	Cys	Glu	Leu	Thr	Val	Asp	Asp	Ile	Met	Pro
512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527
Ala	Val	Lys	Thr	Val	Ile	Arg	Ser	Ile	Arg	Ile	Leu	Lys	Phe	Leu	Val

500	550	600	650	700	750	800	850	900
Ala Lys Arg Lys Phe Lys	Ile Tyr Ile	Arg Pro Tyr Asp Val Lys Asp						
545	555	565	575	585	595	605	615	625
Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Gly Arg Ile								
565	575	585	595	605	615	625	635	645
Lys Ser Leu Gln Thr Arg Val Asp Gln Ile Val Gly Arg Gly Pro Gly								
595	605	615	625	635	645	655	665	675
Asp Arg Lys Ala Arg Glu Lys Gly Asp Lys Gly Pro Ser Asp Ala Glu								
695	685	675	665	655	645	635	625	615
Val Val Asp Glu Ile Ser Met Met Gly Arg Val Val Lys Val Glu Lys								
615	615	625	635	645	655	665	675	685
Gln Val Gln Ser Ile Glu His Lys Leu Asp Leu Leu Leu Gly Phe Tyr								
625	635	645	655	665	675	685	695	705
Ser Arg Cys Leu Arg Ser Gly Thr Ser Ala Ser Leu Gly Ala Val Gln								
645	655	665	675	685	695	705	715	725
Val Pro Leu Phe Asp Pro Asp Ile Thr Ser Asp Tyr His Ser Pro Val								
660	665	670	675	680	685	690	695	700
Asp His Glu Asp Ile Ser Val Ser Ala Gln Thr Leu Ser Ile Ser Arg								
675	680	685	690	695	700	705	710	715
Ser Val Ser Thr Asn Met Asp								
690	695	700	705	710	715	720	725	730

• 210: 3
 • 211: 24
 • 212: DNA
 • 213: Artificial Sequence

• 220:
 • 221: Description of Artificial Sequence: PCR Primer

• 400: 3
 catgggttc tgagcgcccc gagc

24

• 211: 4
 • 211: 4
 • 212: DNA
 • 213: Artificial Sequence

• 220:
 • 221: Description of Artificial Sequence: PCR Primer

• 400: 4
 aggccaggct tgcgcggggaa aacg

24

<210> 5
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<221> Description of Artificial Sequence: PCR Primer

<400> 5
cago-cagag ctgttaatcc agg

23

<210> 6
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<221> Description of Artificial Sequence: PCR Primer

<400> 6
ttatgttgtct ctgagccatg g

21

<210> 7
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> Description of Artificial Sequence: PCR Primer

<400> 7
atgttgtttcccg cgcttgtgacc

20

<210> 8
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<221> Description of Artificial Sequence: PCR Primer

<400> 8
ggttttccagg gtcagagtcg

20

<210> 4
<211> 21
<212> DNA
<213> Artificial Sequence

<221>
<223> Description of Artificial Sequence: PCR Primer

<400> 9
tcggtagccg tgggggggt a 21

<210> 10
<211> 21
<212> DNA
<213> Artificial Sequence

<221>
<223> Description of Artificial Sequence: PCR Primer

<400> 10
tagatagccc ctctgaccc g 21

<210> 11
<211> 21
<212> DNA
<213> Artificial Sequence

<221>
<223> Description of Artificial Sequence: PCR Primer

<400> 11
atccctttcc cgtgtggag c 21

<210> 12
<211> 21
<212> DNA
<213> Artificial Sequence

<221>
<223> Description of Artificial Sequence: PCR Primer

<400> 12
agtcacgatg ggcagaccc g 21

<210> 13
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<213> Description of Artificial Sequence: PCR Primer

<400> 13
cttcatgtatc aaggatctatc 13

<210> 14
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<213> Description of Artificial Sequence: PCR Primer

<400> 14
atgttgtgaca ggggtgagc 19

<210> 15
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<213> Description of Artificial Sequence: PCR Primer

<400> 15
gggttgtggg acacccttgc 20

<210> 16
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<213> Description of Artificial Sequence: PCR Primer

<400> 16
acacagggtt gacacaccc 18

<210> 17
<211> 17
<212> DNA
<213> Artificial Sequence

<214>
<215> Description of Artificial Sequence: PCR Primer

<216> 17
gttctgggtt accatcaact 3'

21

<217> 18
<218> 21
<219> DNA
<220> Artificial Sequence

<221>
<222> Description of Artificial Sequence: PCR Primer

<223> 18
gttccctgg gagccatcac c

21

<224> 19
<225> 20
<226> DNA
<227> Artificial Sequence

<228>
<229> Description of Artificial Sequence: PCR Primer

<230> 19
tgcattcagg agctctgtgc

20

<231> 20
<232> 21
<233> DNA
<234> Artificial Sequence

<235>
<236> Description of Artificial Sequence: PCR Primer

<237> 20
acccacgaag tggctgaagg c

21

· 210 · 21
· 211 · 21
· 212 · LNA
· 213 · Artificial Sequence

· 214 ·
· 215 · Description of Artificial Sequence: PCR Primer

· 216 · 26
gatauscaa~~g~~ a~~g~~atggag~~a~~g 3

21

· 217 · 26
· 218 · 21
· 219 · LNA
· 220 · Artificial Sequence

· 221 ·
· 222 · Description of Artificial Sequence: PCR Primer

· 223 · 26
aact~~t~~ac~~t~~tg cagcagt~~g~~ag c

21

· 224 · 27
· 225 · 21
· 226 · LNA
· 227 · Artificial Sequence

· 228 ·
· 229 · Description of Artificial Sequence: PCR Primer

· 230 · 27
atgc~~t~~tttc~~t~~tc cttcatcagg c

21

· 231 · 28
· 232 · 20
· 233 · LNA
· 234 · Artificial Sequence

· 235 ·
· 236 · Description of Artificial Sequence: PCR Primer

· 237 · 28
aacgcac~~t~~c~~t~~ ccccatgtca

20

· 210 · 31

· 211 · 31

· 212 · DNA

· 213 · Artificial Sequence

· 214 ·

· 215 · Description of Artificial Sequence: PCR Primer

· 216 · 23

tttgcgttcc ccagataaagc

23

· 217 · 30

· 218 · 24

· 219 · DNA

· 220 · Artificial Sequence

· 221 ·

· 222 · Description of Artificial Sequence: PCR Primer

· 223 · 30

tgtgagggag tgagttcaag tacg

24

· 224 · 31

· 225 · 24

· 226 · DNA

· 227 · Artificial Sequence

· 228 ·

· 229 · Description of Artificial Sequence: PCR Primer

· 230 · 31

gtgtatgtat ggagcgccct ctcg

24

· 231 · 32

· 232 · 24

· 233 · DNA

· 234 · Artificial Sequence

· 235 ·

· 236 · Description of Artificial Sequence: PCR Primer

· 237 · 32

tcatccacccg taagctcaca ctgg

24

Met Ala Ala

Ala Ala Ala

Ala Ala Ala

Ala Ala Ala

Met Ala Ala Ala

Ala Ser Ser Pro Pro Arg Ala Glu Arg Lys Arg Trp Gly

1

5

10

15

Trp Gly Arg Leu Pro Gly Ala Arg Arg Gly Ser Ala Gly Leu Ala Lys

21

25

30

Lys Cys Pro Phe Ser Leu Glu Leu Ala Glu Gly Gly Pro Ala Gly Gly

35

40

45

Ala Leu Tyr Ala Pro Ile Ala Pro Gly Ala Pro Gly Pro Ala Pro Pro

50

55

60

Ala Ser Pro Ala Ala Pro Ala Ala Pro Pro Val Ala Ser Asp Leu Gly

65

70

75

80

Pro Arg Pro Pro Val Ser Leu Asp Pro Arg Val Ser Ile Tyr Ser Thr

85

90

95

Arg Arg Pro Val Leu Ala Arg Thr His Val Gln Gly Arg Val Tyr Asn

100

105

110

Phe Leu Glu Arg Pro Thr Gly Trp Lys Cys Phe Val Tyr His Phe Ala

115

120

125

Val Phe Leu Ile Val Leu Val Cys Leu Ile Phe Ser Val Leu Ser Thr

130

135

140

Ile Glu Gln Tyr Ala Ala Leu Ala Thr Gly Thr Leu Phe Trp Met Glu

145

150

155

160

Ile Val Leu Val Val Phe Phe Gly Thr Glu Tyr Val Val Arg Leu Trp

165

170

175

Ser Ala Gly Cys Arg Ser Lys Tyr Val Gly Leu Trp Gly Arg Leu Arg

180

185

190

Phe Ala Arg Lys Pro Ile Ser Ile Ile Asp Leu Ile Val Val Ala

195

200

205

Ser Met Val Val Leu Cys Val Gly Ser Lys Gly Gln Val Phe Ala Thr

210

215

220

Ser Ala Ile Arg Gly Ile Arg Pro Ile Val Ile Leu Ala Arg Met Ile His
 335 340 345 350 355 360 365 370 375 380 385 390 395 400
 Val Asp Arg Phe Gly Gly Thr Trp Arg Leu Leu Gly Ser Val Val Phe
 345 350 355
 Ile His Arg Phe Glu Leu Ile Thr Thr Leu Tyr Ile Gly Phe Leu Gly
 360 365 370
 Leu Ile Phe Ser Ser Tyr Phe Val Tyr Leu Ala Glu Lys Asp Ala Val
 375 380 385
 Asn Glu Ser Gly Arg Val Glu Phe Gly Ser Tyr Ala Asp Ala Leu Trp
 290 295 300
 Trp Gly Val Val Thr Val Thr Ile Gly Tyr Gly Asp Lys Val Pro
 305 310 315 320
 Gln Thr Trp Val Gly Lys Thr Ile Ala Ser Cys Phe Ser Val Phe Ala
 325 330 335
 Ile Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala
 340 345 350
 Leu Lys Val Gln Gln Lys Gln Arg Gln Lys His Phe Asn Arg Gln Ile
 355 360 365
 Pro Ala Ala Ala Ser Leu Ile Gln Thr Ala Trp Arg Cys Tyr Ala Ala
 370 375 380
 Glu Asn Pro Asp Ser Ser Thr Trp Lys Ile Tyr Ile Arg Lys Ala Pro
 385 390 395 400
 Arg Ser His Thr Leu Leu Ser Pro Ser Pro Lys Pro Lys Ser Val
 405 410 415
 Val Val Lys Lys Lys Phe Lys Leu Asp Lys Asn Gly Val Thr
 420 425 430
 Pro Gly Glu Lys Met Leu Thr Val Pro His Ile Thr Cys Asp Pro Pro
 435 440 445
 Glu Glu Arg Arg Leu Asp His Phe Ser Val Asp Gly Tyr Asp Ser Ser
 450 455 460
 Val Arg Lys Ser Pro Thr Leu Leu Glu Val Ser Met Pro His Phe Met
 465 470 475 480

Arg Thr Asp Thr Pro Asp Lys Thr Asp Leu Ala Gly Glu Ala Leu
 470 475 480
 Leu Thr Pro Ile Thr His Ile Ser Gln Leu Arg Glu His His Arg Ala
 485 490 495
 Ile Ile Lys Val Ile Arg Arg Met Gln Tyr Phe Val Ala Lys Lys Lys
 500 505 510 515
 Phe Gln Gln Ala Arg Lys Pro Tyr Asp Val Arg Asp Val Ile Gln Gln
 520 525 530 535
 Tyr Ser Gln Gly His Leu Asn Leu Met Val Arg Ile Lys Glu Leu Gln
 540 545 550 555
 Arg Arg Leu Asp Gln Ser Ile Gly Lys Pro Ser Leu Phe Ile Ser Val
 560 565 570 575
 Ser Glu Lys Ser Lys Asp Arg Gly Ser Asn Thr Ile Gly Ala Arg Leu
 580 585 590
 Asn Arg Val Glu Asp Lys Val Thr Gln Leu Asp Gln Arg Leu Ala Leu
 595 600 605
 Ile Thr Asp Met Leu His Gln Leu Leu Ser Leu His Gly Gly Ser Thr
 610 615 620
 Pro Gly Ser Gly Gly Pro Pro Arg Glu Gly Gly Ala His Ile Thr Gln
 625 630 635 640
 Pro Cys Gly Ser Gly Gly Ser Val Asp Pro Glu Leu Phe Leu Pro Ser
 645 650 655
 Asn Thr Leu Pro Thr Tyr Glu Gln Leu Thr Val Pro Arg Arg Gly Pro
 660 665 670
 Asp Glu Gly Ser
 675

- 210: 34
- 211: 844
- 212: PRT
- 213: *Homo sapiens*

Met Val Gln Lys Ser Arg Asn Gly Gly Val Tyr Pro Gly Pro Ser Gly
 1 5 10 15

Ser Lys Lys Ile Lys Val Gly Ile Val Gly Ile Asp Ile Gly Ala Pro
 30 40 50
 Asp Ser Thr Arg Asp Gly Ala Ile Ile Ile Ala Gly Ser Glu Ala Pro
 35 45 55
 Lys Arg Gly Ser Ile Ile Ser Lys Pro Arg Ala Gly Gly Ala Gly Ala
 60 65 70 75 80
 Gly Lys Pro Pro Lys Arg Asn Ala Phe Tyr Arg Lys Leu Gln Asn Phe
 85 90 95
 Leu Tyr Asn Val Ile Glu Arg Pro Arg Gly Trp Ala Phe Ile Tyr His
 100 105 110
 Ala Tyr Val Phe Ile Leu Val Phe Ser Cys Leu Val Ile Ser Val Phe
 115 120 125
 Ser Thr Ile Lys Glu Tyr Glu Lys Ser Ser Glu Gly Ala Leu Tyr Ile
 130 135 140
 Leu Glu Ile Val Thr Ile Val Val Phe Gly Val Glu Tyr Phe Val Arg
 145 150 155 160
 Ile Trp Ala Ala Gly Cys Cys Cys Arg Tyr Arg Gly Trp Arg Gly Arg
 170 175
 Leu Lys Phe Ala Arg Lys Pro Phe Cys Val Ile Asp Ile Met Val Leu
 180 185 190
 Ile Ala Ser Ile Ala Val Leu Ala Ala Gly Ser Gln Gly Asn Val Phe
 195 200 205
 Ala Thr Ser Ala Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met
 210 215 220
 Ile Arg Met Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Val
 225 230 235 240
 Val Tyr Ala His Ser Lys Glu Leu Val Thr Ala Trp Tyr Ile Gly Phe
 245 250 255
 Leu Cys Leu Ile Leu Ala Ser Phe Leu Val Tyr Leu Ala Glu Lys Gly
 260 265 270
 Glu Asn Asp His Phe Asp Thr Tyr Ala Asp Ala Leu Trp Trp Gly Leu

Ile Thr Leu Thr Thr Ile Ile Tyr Lys Asp Lys Tyr Ile Thr Thr Ile
 271 272 273 274 275

Asn Gly Arg Leu Leu Ala Ala Thr Phe Thr Leu Ile Gly Val Ser Phe
 276 277 278 279

Phe Ala Leu Pro Ala Gly Ile Leu Gly Ser Gly Phe Ala Leu Lys Val
 280 281 282 283

Gln Glu Gln His Arg Gln Lys His Phe Glu Lys Arg Arg Asn Pro Ala
 285 286 287 288

Ala Gly Leu Ile Gln Ser Ala Trp Arg Phe Tyr Ala Thr Asn Leu Ser
 290 291 292 293

Arg Thr Asp Leu His Ser Thr Trp Gln Tyr Tyr Glu Arg Thr Val Thr
 295 296 297 298

Val Pro Met Tyr Arg Leu Ile Pro Pro Leu Asn Gln Leu Glu Leu Leu
 300 301 302 303

Arg Asn Leu Lys Ser Lys Ser Gly Leu Ala Phe Arg Lys Asp Pro Pro
 305 306 307 308 309 310 311 312

Pro Glu Pro Ser Pro Ser Gln Lys Val Ser Leu Lys Asp Arg Val Phe
 315 316 317 318 319 320 321 322

Ser Ser Pro Arg Gly Val Ala Ala Lys Gly Lys Gly Ser Pro Gln Ala
 325 326 327 328 329 330 331 332

Gln Thr Val Arg Arg Ser Pro Ser Ala Asp Gln Ser Leu Glu Asp Ser
 335 336 337 338 339 340 341 342

Pro Ser Lys Val Pro Lys Ser Trp Ser Phe Gly Asp Arg Ser Arg Ala
 345 346 347 348 349 350 351 352

Arg Gln Ala Phe Arg Ile Lys Gly Ala Ala Ser Arg Gln Asn Ser Glu
 355 356 357 358 359 360 361 362

Glu Ala Ser Leu Pro Gly Glu Asp Ile Val Asp Asp Lys Ser Cys Pro
 365 366 367 368 369 370 371 372

Cys Glu Phe Val Thr Glu Asp Leu Thr Pro Gly Leu Lys Val Ser Ile
 375 376 377 378 379 380 381 382

Arg Ala Val Cys Val Met Arg Phe Leu Val Ser Lys Arg Lys Phe Lys
 385 386 387 388 389 390 391 392

Val Ser Leu Arg Pro Tyr Asp Val Met Asp Val Ile Ser Glu Tyr Ser
 581 582 583 584

Ala Gly His Leu Asp Met Ile Ser Arg Ile Lys Ser Leu Glu Ser Arg
 585 586 587 588 589

Val Asp Glu Ile Val Gly Arg Gly Pro Ala Ile Thr Asp Lys Asp Arg
 590 591 592 593 594

Thr Lys Gly Pro Ala Glu Ala Glu Leu Pro Glu Asp Pro Ser Met Met
 595 596 597 598

Gly Arg Ile Gly Lys Val Glu Lys Gln Val Ile Ser Met Glu Lys Lys
 600 601 602 603

Leu Asp Phe Leu Val Asn Ile Tyr Met Gln Arg Met Gly Ile Pro Pro
 605 606 607 608

Thr Glu Thr Glu Ala Tyr Phe Gly Ala Lys Glu Pro Glu Pro Ala Pro
 610 611 612 613 614

Pro Tyr His Ser Pro Glu Asp Ser Arg Glu His Val Asp Arg His Gly
 615 616 617 618 619

Cys Ile Val Lys Ile Val Arg Ser Ser Ser Ser Thr Gly Gln Lys Asn
 620 621 622 623 624

Phe Ser Ala Pro Pro Ala Ala Pro Pro Val Gln Cys Pro Pro Ser Thr
 625 626 627 628 629

Ser Trp Gln Pro Gln Ser His Pro Arg Gln Gly His Gly Thr Ser Pro
 630 631 632 633 634

Val Gly Asp His Gly Ser Leu Val Arg Ile Pro Pro Pro Ala His
 635 636 637 638 639

Glu Arg Ser Leu Ser Ala Tyr Gly Gly Asn Arg Ala Ser Met Glu
 640 641 642 643 644

Phe Leu Arg Gln Glu Asp Thr Pro Gly Cys Arg Pro Pro Glu Gly Thr
 645 646 647 648 649

Leu Arg Asp Ser Asp Thr Ser Ile Ser Ile Pro Ser Val Asp His Glu
 650 651 652 653 654

Glu Leu Glu Arg Ser Phe Ser Gly Phe Ser Ile Ser Gln Ser Lys Glu
 655 656 657 658 659

Asn Leu Asp Ala Leu Asp Ser Cys Tyr Ala Ala Val Ala Pro Lys Ala
810 811 812 813 814 815 816 817 818 819

Lys Val Arg Pro Tyr Ile Ala Glu Gly Ser Asp Thr Asp Ser Asp
819 820 821 822 823 824 825 826 827 828

Leu Cys Thr Pro Cys Gly Pro Pro Pro Arg Ser Ala Thr Gly Glu Gly
826 827 828 829 830 831 832 833 834 835

Pro Phe Gly Asp Val Gly Trp Ala Gly Pro Arg Lys
835 836 837 838 839 840

8210. 35

8211. 872

8212. PRT

8213. Homo sapiens

8400. 35

Met Gly Leu Lys Ala Arg Arg Ala Ala Gly Ala Ala Gly Gly Gly
1 5 10 15

Asp Gly Gly Gly Gly Gly Ala Ala Asn Pro Ala Gly Gly Asp
20 25 30

Ala Ala Ala Ala Gly Asp Glu Glu Arg Lys Val Gly Leu Ala Pro Gly
35 40 45

Asp Val Glu Gln Val Thr Leu Ala Leu Gly Ala Gly Ala Asp Lys Asp
50 55 60

Gly Thr Leu Leu Leu Glu Gly Gly Arg Asp Glu Gly Gln Arg Arg
65 70 75 80

Thr Pro Gln Gly Ile Gly Leu Leu Ala Lys Thr Pro Leu Ser Arg Pro
85 90 95

Val Lys Arg Asn Asn Ala Lys Tyr Arg Arg Ile Gln Thr Leu Ile Tyr
100 105 110

Asp Ala Leu Glu Arg Pro Arg Gly Trp Ala Leu Leu Tyr His Ala Leu
115 120 125

Val Phe Leu Ile Val Leu Gly Cys Leu Ile Leu Ala Val Leu Thr Thr
130 135 140

Phe Lys Glu Tyr Glu Thr Val Ser Gly Asp Trp Leu Leu Leu Glu

140	145	150	155
Thr Phe Ala Ile Ile Ile Ile Gly Ala Glu Phe Ala Leu Arg Ile Trp			
160	165	170	175
Ala Ala Gly Cys Lys Cys Arg Tyr Lys Gly Trp Arg Gly Arg Leu Lys			
180	185	190	195
Phe Ala Arg Lys Pro Leu Cys Met Leu Asp Ile Phe Val Leu Ile Ala			
195	200	205	210
Ser Val Pro Val Val Ala Val Gly Asn Gln Gly Asn Val Leu Ala Thr			
210	215	220	225
Ser Leu Arg Ser Leu Arg Phe Leu Gln Ile Leu Arg Met Leu Arg Met			
225	230	235	240
Asp Arg Arg Gly Gly Thr Trp Lys Leu Leu Gly Ser Ala Ile Cys Ala			
245	250	255	260
His Ser Lys Glu Leu Ile Thr Ala Trp Tyr Ile Gly Phe Leu Thr Ile			
260	265	270	275
Ile Leu Ser Ser Phe Leu Val Tyr Leu Val Glu Lys Asp Val Pro Glu			
275	280	285	290
Val Asp Ala Gln Gly Glu Glu Met Lys Glu Glu Phe Glu Thr Tyr Ala			
290	295	300	305
Asp Ala Leu Trp Trp Gly Leu Ile Thr Leu Ala Thr Ile Gly Tyr Gly			
305	310	315	320
Asp Lys Thr Pro Lys Thr Trp Glu Gly Arg Leu Ile Ala Ala Thr Phe			
325	330	335	340
Ser Leu Ile Gly Val Ser Phe Phe Ala Leu Pro Ala Gly Ile Leu Gly			
340	345	350	355
Ser Gly Leu Ala Leu Lys Val Gln Glu Gln His Arg Gln Lys His Phe			
355	360	365	370
Glu Lys Arg Arg Lys Pro Ala Ala Glu Leu Ile Gln Ala Ala Trp Arg			
370	375	380	385
Tyr Tyr Ala Thr Asn Pro Asn Arg Ile Asp Leu Val Ala Thr Trp Arg			
385	390	395	400
Phe Tyr Glu Ser Val Val Ser Phe Pro Phe Phe Arg Lys Glu Gln Leu			

	410	411
Ala Ala Ala Ser Ser Glu Lys Leu Gly Leu Leu Asp Arg Val Arg Leu		
410	411	
Ser Asn Pro Arg Gly Ser Asn Thr Lys Gly Lys Leu Phe Thr Pro Leu		
412	413	
Asn Val Asp Ala Ile Glu Glu Ser Pro Ser Lys Glu Pro Lys Pro Val		
414	415	
Gly Leu Asn Asn Lys Glu Arg Phe Arg Thr Ala Phe Arg Met Lys Ala		
416	417	418
Tyr Ala Phe Trp Gln Ser Ser Glu Asp Ala Gly Thr Gly Asp Pro Met		
419	420	421
Ala Glu Asp Arg Gly Tyr Gly Asn Asp Phe Pro Ile Glu Asp Met Ile		
422	423	424
Pro Thr Leu Lys Ala Ala Ile Arg Ala Val Arg Ile Leu Gln Phe Arg		
425	426	427
Leu Tyr Lys Lys Phe Lys Glu Thr Leu Arg Pro Tyr Asp Val Lys		
428	429	430
Asp Val Ile Glu Gln Tyr Ser Ala Gly His Leu Asp Met Leu Ser Arg		
431	432	433
Ile Lys Tyr Leu Gln Thr Arg Ile Asp Met Ile Phe Thr Pro Gly Pro		
434	435	436
Pro Ser Thr Pro Lys His Lys Ser Gln Lys Gly Ser Ala Phe Thr		
437	438	439
Phe Pro Ser Gln Gln Ser Pro Arg Asn Glu Pro Tyr Val Ala Arg Pro		
440	441	442
Ser Thr Ser Glu Ile Glu Asp Gln Ser Met Met Gly Lys Phe Val Lys		
443	444	445
Val Glu Arg Gln Val Gln Asp Met Gly Lys Lys Leu Asp Phe Leu Val		
446	447	448
Asp Met His Met Gln His Met Glu Arg Leu Gln Val Gln Val Thr Glu		
449	450	451
Tyr Tyr Pro Thr Lys Gly Thr Ser Ser Pro Ala Glu Ala Glu Lys Lys		

Ala Asp Asn Arg Tyr Ser Asp Leu Lys Thr Ile Phe Lys Asn Tyr Ser
 679 680 681 682
 Ala Thr Gly Pro Pro Glu Pro Tyr Ser Phe His Glu Val Thr Ile
 683 684 685 686
 Asp Lys Val Ser Pro Tyr Glu Phe Ala His Asp Pro Val Asn Leu
 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701
 Pro Arg Gly Gly Pro Ser Ser Gly Lys Val Gln Ala Thr Pro Pro Ser
 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716
 Ser Ala Thr Thr Tyr Val Glu Arg Pro Thr Val Leu Pro Ile Ile Thr
 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731
 Leu Leu Asp Ser Arg Val Ser Cys His Ser Gln Ala Asp Leu Gln Gly
 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747
 Pro Tyr Ser Asp Arg Ile Ser Pro Arg Gln Arg Arg Ser Ile Thr Arg
 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763
 Asp Ser Asp Thr Pro Leu Ser Leu Met Ser Val Asn His Glu Glu Leu
 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779
 Glu Arg Ser Pro Ser Gly Phe Ser Ile Ser Gln Asp Arg Asp Asp Tyr
 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795
 Val Phe Gly Pro Asn Gly Gly Ser Ser Trp Met Arg Glu Lys Arg Tyr
 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811
 Leu Ala Glu Gly Glu Thr Asp Thr Asp Thr Asp Pro Phe Thr Pro Ser
 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827
 Gly Ser Met Pro Leu Ser Ser Thr Gly Asp Gly Ile Ser Asp Ser Val
 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843
 Trp Thr Pro Ser Asn Lys Pro Ile
 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859

<210> 36
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>

<210> Description of Artificial Sequence: PCR Primer

<400> 36

aaaggatggat cagtttttgg 3

21

<210> 37

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR Primer

<400> 37

aggttggcag gtgtttgtg g

21

<210> 38

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR Primer

<400> 38

gtccatggcac ctcccccgta g

21

<210> 39

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR Primer

<400> 39

ttccatgtcaa tgttagggct gac

23

<210> 40

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

Sequence Listing of Artificial Sequence of the Invention

<400> 41

CCAGGGATG TACCTATATG AGTC

24

<400> 41

<400> 24

<400> DNA

<400> Artificial Sequence

<223>

<223> Description of Artificial Sequence: PCR Primer

<400> 41

ccagaagagtc aagatgggca ggac

24